

Innovative, efficient, and shear-free single-use flow control technology: ProConnex® DRV

Data Sheet

ProConnex® Diaphragm Replacement Valve (DRV)

Traditional stainless steel diaphragm valves by design create hold-ups, flow restrictions, and cause cell shear when in an open state. Additionally, these valves require extensive sterilization between uses, increasing time, effort, cost, and risk of cross-contamination.

The ProConnex® DRV, powered by innovative Artesyn® valve technology, is a direct drop-in replacement for your existing stainless steel diaphragm valves. Silicone valve liners create a complete single-use contact layer, allowing for easy adoption of economic, efficient single-use processing practices.

The DRV eliminates shear stress, hold-ups, and flow restrictions caused by traditional diaphragm valves. The engineered full bore, encapsulated design allows enables higher level of process safety and drug yields in bioprocessing.

The simple and secure single-use liner setup allows for quick and reliable fluid control at a predictable operating cost. This technology also eliminates the need for cleaning and ensures functional reliability of critical valves at point of use. Made of platinum cured silicone specifically for ProConnex® DRVs, these liners significantly improve installation time, increase flow rates, and reduce the risk of cross-contamination.

Applications

With a range of sizes, the ProConnex® Valves are suitable for use in liquid or gas fluid streams throughout the bioprocessing workflow. The DRVs are also designed for use in both traditional and hybrid facilities. The valve bodies are manufactured from high end 316 L stainless steel ensuring they meet the highest quality standards. Polymer valve bodies are also available.

Upstream

- Media and Buffer Preparation
- Cell Clarification Harvest
- Perfusion
- Filtration
- Mixing

Downstream

- Filtration
- Chromatography
- Buffer Exchange
- Virus Inactivation
- Concentration
- Fractionation
- Transfer
- Finish Filling
- Mixing



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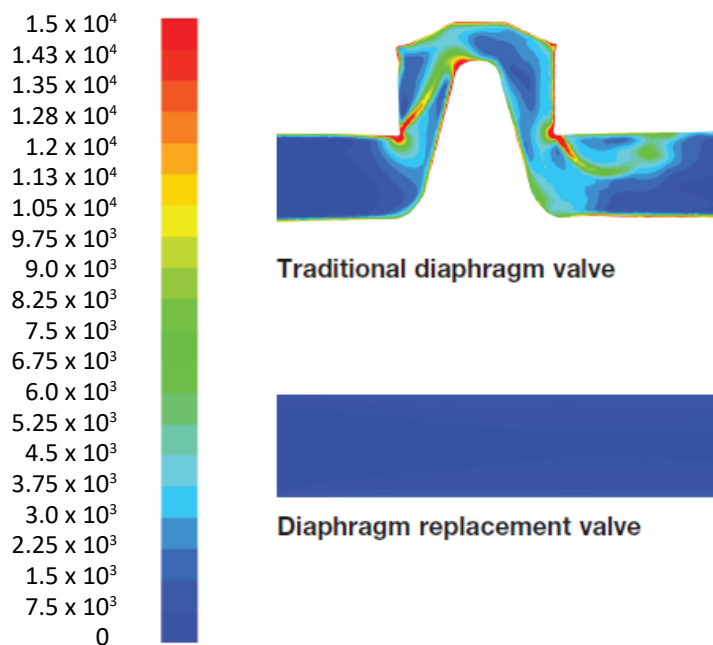
Performance

Optimized Flow Control with No Shear Stress

The flow coefficient is a relative measurement of the valve efficacy to allow fluid to flow through. In an open position, the diaphragm replacement valve has identical flow characteristics as a straight tube.

Computational fluid dynamics allows us to visualize this difference in flow throughput and its effect on shear stress through calculation of the shear strain of the two different valve concepts.

Both the diaphragm replacement valve and a traditional diaphragm valve design on a ½ in internal diameter flow path are compared in the below diagram.



Increase manufacturing efficiency through easy installation and increased drug yield, with no down time

Traditional components 

ProConnex® DRV Valve 



VS



Traditional stainless steel diaphragm valve –
 Many parts requiring extensive setup and cleaning

Repligen ProConnex® DRV Valve –
 Intuitive, tool-free, consistent simple setup



Features

Single-use Flow Path Silicone Only

- Reduced downtime
- No cleaning validation
- Eliminates batch-to-batch cross contamination risk
- Provides highest reliability for critical valves

Tool Free Installation

- Safe, reliable, and simplified processing

Liner Encapsulation

- Suits both pressurized and unpressurized applications
- Liner shape restoration, ensures flow consistency after closure cycle

Seal Free Hemispherical Closure

- Carefully sized stem to valve seat combination ensures high closure resistance and reliability with minimal material stress
- Intrinsic travel stop avoids over compression
- No entrapment areas
- No product loss

Visual Indicator

- Simple verification of valve open or close position for operators

Manual or Pneumatic Actuation

- Align to operation preference
- Manual actuation allows for gradual control, pneumatic actuation for on/off control

Quality Standards

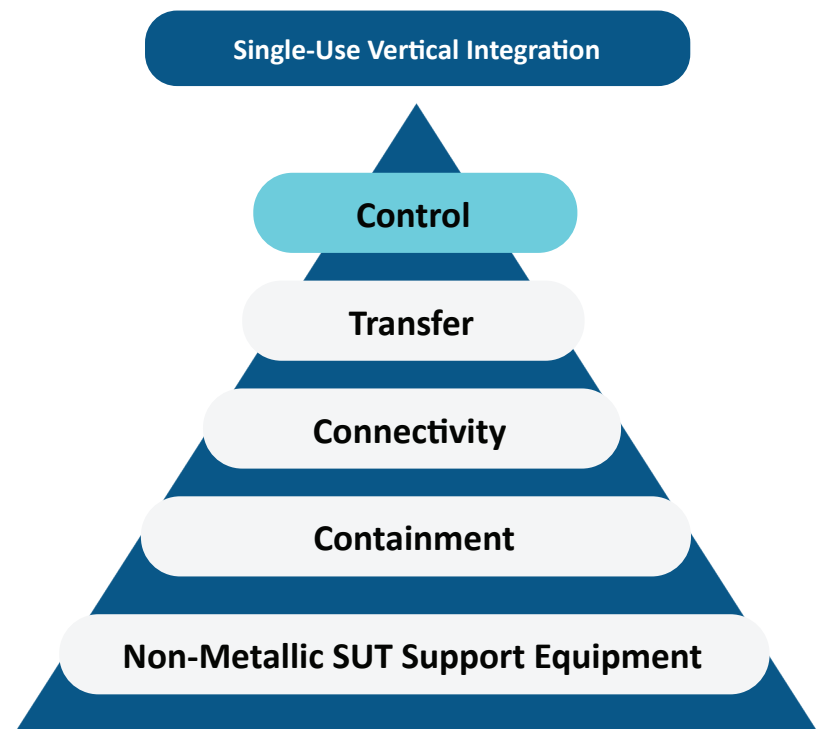
- Manufacturing in ISO Class 7 clean room
- Double-bagged in cleanroom
- Animal derived component free (ADCF) material, including BSE/TSE risk free

Sterilization: Consumable

- No changes in heat sterilization method of choice
- **Autoclave:** One 75-minute cycle at 130° C
- **In situ steam:** One 75-minute cycle at 130° C

Operating Conditions

- Maximum pressure: 4 barg at 60° C
- Temperature range: From 2 to 60° C
- Normal pneumatic valve state: Normally closed

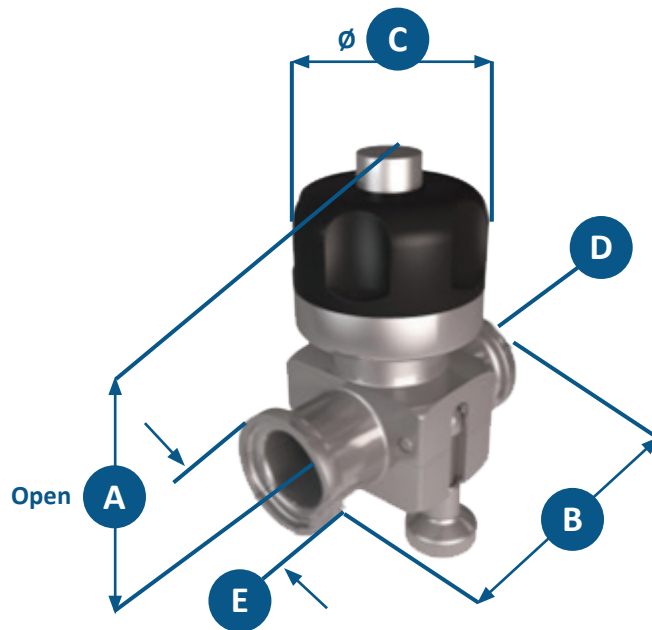


Repligen ProConnex® fluid management solutions enable you to control, transfer, contain, and connect throughout your entire workflow with nearly limitless customization options built to your unique needs. Our open-source approach to vertical integration offers supply chain management of your complete assembly, providing the flexibility and security of supply you need to move your process forward.

Critical Parameters - Manual

Valve description	A	B	C	D	E	Weight
AC – Mini sanitary clamp x 0.37 in internal diameter (ID)	2.4 in (62 mm)	2.5 in (64 mm)	1.5 in (38 mm)	½ in (DN15)	1 in (25 mm)	0.3 kg
AD – Mini sanitary clamp x 0.62 in taper ID to 0.37 in bore ID	2.4 in (62 mm)	2.5 in (64 mm)	1.5 in (38 mm)	¾ in (DN20)	1 in (25 mm)	0.3 kg
AE – 1 in sanitary clamp x 0.87 in ID	4.3 in (110 mm)	4 in (101 mm)	2.4 in (60 mm)	1 in (DN25)	2 in (51 mm)	1.3 kg
AG – 1 ½ in sanitary clamp x 1.37 in ID	6.3 in (159 mm)	5.7 in (145.7 mm)	3.4 in (86 mm)	1 ½ in (DN40)	2 in (51 mm)	2.2 kg

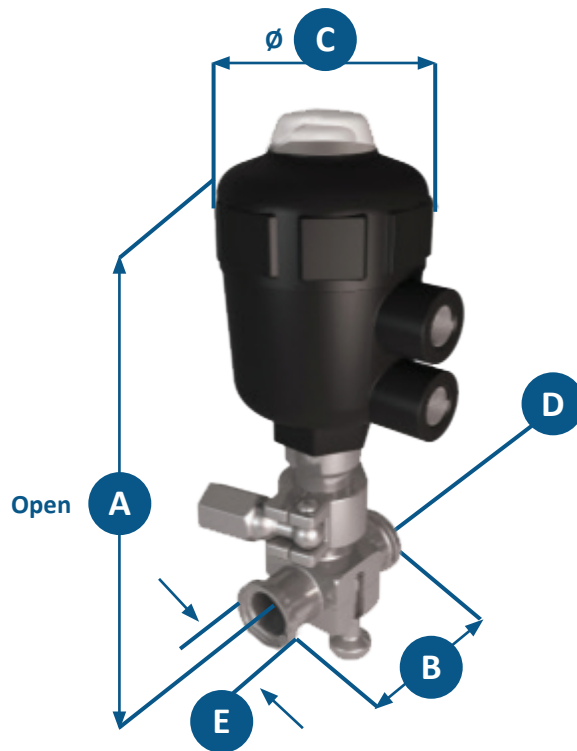
Note: Sanitary liner connections have an integrated male gasket profile.



Critical Parameters - Pneumatic

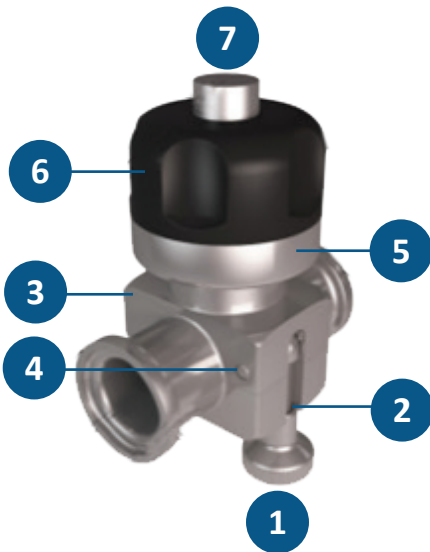
Valve description	A	B	C	D	E	Weight
AC – Mini sanitary clamp x 0.37 in internal diameter (ID)	6.3 in (159 mm)	2.5 in (64 mm)	2.5 in (63 mm)	½ in (DN15)	1 in (25 mm)	0.9kg
AD – Mini sanitary clamp x 0.62 in taper ID to 0.37 in bore ID	6.3 in (159 mm)	2.5 in (64 mm)	2.5 in (63 mm)	¾ in (DN20)	1 in (25 mm)	0.9 kg
AE – 1 in sanitary clamp x 0.87 in ID	7.5 in (190 mm)	4 in (101 mm)	2.4 in (79 mm)	1 in (DN25)	2 in (51 mm)	3.1 kg
AG – 1 ½ in sanitary clamp x 1.37 in ID	11.8 in (298.7 mm)	5.7 in (145.7 mm)	3.4 in (97 mm)	1 ½ in (DN40)	2 in (51 mm)	5.5 kg

Note: Sanitary liner connections have an integrated male gasket profile.



Materials of Construction

Manual ProConnex® DRV



Number	Component	Material
1	Lock knob	Stainless steel 316 L
2	Swing arm	Stainless steel 18-8
3	Valve body	Stainless steel 316 L
4	Body pins	Stainless steel 316 L
5	Lower handle	Stainless steel 316 L
6	Handle	Polyetherimide (PEI)
7	Stem	Stainless steel 316 L

Pneumatic ProConnex® DRV



Number	Component	Material
1	Lock knob	Stainless steel 316 L
2	Swing arm	Stainless steel 18-8
3	Valve body	Stainless steel 316 L
4	Body pins	Stainless steel 316 L
5	Assembly clamp	Stainless steel 304
6	Actuator body	Stainless steel 316 L
7	Air Ports ¼ in BSP	Stainless steel 304
8	Actuator housing	Polyamide (PA)
9	Actuator cap	Polyamide (PA)
10	Indicator lens	Polycarbonate (PC)

Innovative, efficient, and shear-free single-use flow control technology: DRV Silicone Liners

ProConnex® Diaphragm Replacement Valve (DRV) Liners are made of platinum cured silicone material, which is developed to significantly improve installation time, increase flow rates and reduce the risk of cross-contamination for ProConnex® DRVs.

Developed as a result of 20 years of manufacturing experience, this ProConnex® DRV Liner is specifically designed for the ProConnex® DRV to be flexible yet durable and with limited product contact only with silicone liner.

These Class 7 clean room produced and double-packaged ProConnex® DRV Liners conform to several USP and ISO requirements, along with using Animal Derived Content Free (ADCF) raw material.

Features

- 60 Durometer, Shore A hardness material
- Eliminates entrapment issues, reduces chance of cross-contamination
- Zero dead legs
- High quality and cost effective
- Reduces assembly times
- Unique DRV design limits product contact exclusively to silicone liner
- Gamma sterilization available
- Integrated gaskets included, minimizing the connection sealing surface and reducing the number of additional parts



Biocompatibility and Regulatory Info

- USP 87
- USP 88
- USP 661
- ISO 10993-6
- ISO 10993-10
- ISO 10993-11
- EP 3.1.9
- CFR 177.2600
- ADCF
- USP Class VI
- NO DEHP or BPA

Applications

- Sterile filling and protection
- Filtration and fermentation
- Drug delivery and discovery systems
- Media dispensing

Note: Validation Summary and Regulatory Information Guide (RIG) available upon request.

Ordering Information - Valves and Liners

Sizes	Manual	Pneumatic	Liner Part Number	Liner Gamma Irradiation
AC – Mini sanitary clamp, 0.37 in (9.4 mm) ID	DRVSAC16	DRVSAC19	DRVACS	- G - Gamma irradiated
AD – Mini sanitary clamp, 0.62 in (15.7 mm) taper ID	DRVSAD16	DRVSAD19	DRVADS	- Non-Gamma irradiated
AE – 1 in sanitary clamp (M), 0.87 in (22.1 mm) ID	DRVSAE16	DRVSAE19	DRVAES	
AF – 1 in sanitary clamp, 0.750 in (19.1 mm) ID	DRVSAF16	DRVSAF19	DRVAFS	
AJ – 1 in sanitary clamp, 1.000 in (25.4 mm) ID	DRVSAJ16	DRVSAJ19	DRVAJS	
AG – 1 ½ sanitary clamp (M), 1.37 in (34.8 mm) ID	DRVSAG16	DRVSAG19	DRVAGS	
AH – 2 in sanitary clamp with 1.870 in (47.5 mm) ID	DRVSAH16	DRVSAH19	DRVAHS	

Accessories

Description	Part Number	Matching Valve	Valve Version
Mini sanitary ½ in clamp rod bracket	ARTD001031	DRVSAC19 DRVSAD19	Pneumatic Only
Sanitary 1 ½ in clamp with rod bracket	ARTD001030	DRVSAE19 DRVSAG19	Pneumatic Only

Customer Service

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